TITLE

COMPUTER SYSTEM AND METHOD FOR STORING TV SIGNALS THEREIN

CLAIM OF PRIORITY

[0001] This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. §119 from my application *COMPUTER SYSTEM AND METHOD FOR STORING TV SIGNALS THEREIN* filed with the Korean Industrial Property Office on 19 October 2000 and there duly assigned Serial No. 61708/2000.

BACKGROUND OF THE INVENTION

Technical Field

[0002] The present invention relates to a computer system and a method for storing television (TV) signals therein.

Related Art

[0003] As computer relevant technologies have rapidly been progressed, a variety of applications thereof have been developed accordingly. Especially, one of the technical fields showing the rapid progress is a multimedia field, employing Moving Picture Experts Group (MPEG) standar ds for compression techniques of moving pictures. As such a multimedia technology has been developed, the computer has been able to serve for the appreciation of

digital music and reception of television (TV) broadcasting based on public networks. In case of the reception of television signals via a computer, it is advantageous that clear images can be provided because scanning lines of a monitor of the computer are much more than those of the television screen.

[0004] I have found that there is a need to receive and record television signals with a computer in conjunction with power saving features, efficiency, and convenience. Efforts have been made in the area of television signals and video signals.

[0005] Exemplars of recent efforts in the art include Korean Patent First Publication No. 003127/1993 to Sung-Won Cho, entitled *METHOD OF CONTROLLING A VIDEO CASSETTE RECORDER BY USING A COMPUTER CONNECTED TO THE VIDEO CASSETTE RECORDER*, published on 24 February 1993, Korean Patent First Publication No. 008138/1997 to Bong-Chul OH, entitled *METHOD OF PROGRAMMING FOR RECORDING A TV BROADCASTING CHANNEL BY USING A COMPUTER CONNECTED TO THE TV*, published on 24 February 1997, Korean Patent First Publication No. 016781/1998 to Yoon-Soo Shin, entitled *METHOD OF PROGRAMMING FOR RECORDING IN A VCR BY USING A COMPUTER CONNECTED TO THE VCR*, published on 5 June 1998, Korean Patent First Publication No. 017887/1998 to Ki-Bok Moon, entitled *METHOD OF PROGRAMMING FOR RECORDING IN A PC-VCR*, published on 5 June 1998, Korean Patent First Publication No. 041359/1999 to Kyu-Nam Kim, entitled *METHOD OF STORING INFORMATION ABOUT*

INTERNET SITES, published on 15 June 1999, Korean Patent First Publication No. 004315/2000 to Sham Lee, entitled *METHOD OF CONTROLLING A POWER OF A DIGITAL TELEVISION HAVING A PERSONAL COMPUTER FUNCTION AND A TELEVISION FUNCTION*, published on 25 January 2000, Japanese Patent First Publication No. 9-128090 to Sato, entitled *VTR-INCORPORATED PERSONAL COMPUTER*, published on 16 May 1997, Japanese Patent First Publication No. 10-177777 to Nakajima, entitled *PROGRAM RESERVATION SYSTEM AND RECORDING MEDIUM*, published on 30 June 1998, and Japanese Patent First Publication No. 11-110089 to Kashimoto *et al.*, entitled *COMPUTER SYSTEM AND NETWORK CONTROLLER USED BY SAME COMPUTER SYSTEM*, published on 23 April 1999.

[0006] While these recent efforts provide advantages, I note that they fail to adequately provide a system and method for receiving and recording television signals with a computer, in conjunction with power saving features, efficiency, and convenience.

SUMMARY OF THE INVENTION

[0007] Therefore, the present invention has been made in view of the above shortcomings, and it is an object of the present invention to provide a computer system which is automatically turned on when a television program reserve-recording starts and is automatically turned off when the rec ording is finished, thereby saving the power consumption due to the reserve-recording, and a method for storing television signals therein.

[0008] This and other objects of the present invention may be achieved by a provision of a

computer comprising a central processing unit (CPU) driving an operating system (OS), further comprising a television receiver part receiving external television signals; a storage unit storing the television signals therein; a reserve-recording set-up part setting up reserve-recording conditions for the television signals; a record-controlling part storing the television signals in the storage unit according to the set-up reserve-recording conditions; and a power control part controlling power supply to allow a normal mode and a power saving mode to be switched therebetween, and switching the power saving mode to the normal mode according to the set-up reserve-recording conditions when time for reserve-recording approaches, wherein a power is supplied to the central processing unit under the normal mode whereas the power is not supplied to the central processing unit under the power saving mode.

[0009] Preferably, the reserve-recording set-up part comprises a password skipping part skipping a password when the power saving mode is changed to the normal mode where the password is given to the computer system.

[0010] It is also effective that the power control part changes the power mode of the central processing unit from the normal mode to the power saving mode after reserve-recording conditions are set up through the reserve-recording set-up part, the reserve-recording set-up part further comprises a mode selection window display for selecting the power mode of the central processing unit after the reserve-recording conditions are set up, and the power control part switches the power mode of the central processing unit according to selection of the power mode

through the mode selection window display.

[0011] Preferably, the power control part switches the power mode of the central processing unit from the normal mode to the power saving mode after the reserve-recording of the television signals is finished, and the record-controlling part further comprises a mode selection window display for selecting the power mode of the central processing unit after the reserve-recording conditions are set up.

[0012] Effectively, the power control part switches the power mode of the central processing unit from the power saving mode to the normal mode when the power is supplied to the computer system by a user where the computer system is in the power saving mode, and the reserve-recording part comprises an identification window display for identifying the reserve-recording conditions when the power saving mode of the central processing unit is changed to the normal mode, wherein the identification window display enables withdrawal, change and approval of the set-up reserve-recording conditions therethrough.

[0013] It is preferable that the storage unit is comprised of any one of a hard disk drive, a recordable compact disk drive, and a recordable digital versatile disk (DVD) drive.

[0014] According to another aspect of the present invention, this and other objects may also be achieved by a provision of a method for storing television signals in a computer comprising a

central processing unit, an input unit, a monitor, a readable and writable storage unit and a television receiver part receiving the television signals and outputting the television signals to the monitor, comprising the steps of setting up reserve-recording conditions to record the television signals received through the receiver part in the storage unit; switching a power mode of the central processing unit from a power saving mode to a normal mode when reserve-recording is initiated according to the set-up reserve-recording conditions wherein a power is supplied to the central processing unit under the normal mode whereas the power is not supplied to the central processing unit under the power saving mode; and storing the television signals in the storage unit according to the reserve-recording conditions.

[0015] Preferably, the switching step comprises the step of determining whether a password is given to the computer system; and the step of skipping the password where it is determined that the password is given to the computer system.

[0016] The method according to the present invention further comprises the step of switching the power mode of the central processing unit from the normal mode to the power saving mode after setting up of the reserve-recording conditions is finished, and also the step of displaying a mode selection window display allowing a user to select a power mode of the central processing unit after setting up of the reserve-recording conditions is finished.

[0017] Desirably, the method further comprises the step of switching the power mode of the

central processing unit from the normal mode to the power saving mode after reserve-recording of the television signals is finished, and also the step of displaying a mode selection window display allowing a user to select the power mode of the central processing unit after reserve-recording of the television signals is finished.

Sub B1 **[0018]** The method further comprises the step of switching the power mode of the central processing unit from the power saving mode to the normal mode when the power is supplied to the computer system by a user where the computer system is in the power saving mode, and the step of displaying an identification window display for identifying the reserve-recording conditions where the power mode of the central processing unit is switched from the power mode to the normal mode.

Sub B2 **[0019]** According to still another aspect of the present invention, this and other objects may also be achieved by a provision of a method for storing television signals in the computer system, allowing a normal mode and a power saving mode to be switched therebetween wherein a power is supplied to the central processing unit under the normal mode whereas the power is not supplied to the central processing unit under the power saving mode, comprising the steps of setting up reserve-recording conditions such as start time of the reserve-recording of the television signals; identifying whether the power mode of the central processing unit is the power saving mode when a start time of the reserve-recording approaches; and storing the television signals received from the outside by converting the power saving mode to the normal mode

B2 cancel.

thereof, if the power mode of the central processing unit is the power saving mode.

[0020] Preferably, the method further comprises the step of switching the power mode of the central processing unit from the normal mode to the power saving mode after setting up of the reserve-recording conditions is finished, the step of switching the power mode of the central processing unit from the normal mode to the power saving mode after reserve-recording of the television signals is finished, and the step of switching the power mode of the central processing unit from the power saving mode to the normal mode when the power is supplied to the computer system by a user where the computer system is in the power saving mode.

[0021] To achieve these and other objects in accordance with the principles of the present invention, as embodied and broadly described, the present invention provides a computer apparatus, comprising: a central processing unit driving an operating system; a recording set-up unit setting recording conditions for recording television signals; a control unit controlling the recording of the television signals in dependence upon the recording conditions; a storage unit storing the television signals; a power control unit controlling power supplied in a normal mode and in a power saving mode, automatically switching the power saving mode to the normal mode in dependence upon the recording conditions, a power being supplied to said central processing unit in the normal mode, the power not being supplied to said central processing unit in the power saving mode.

[0022] The present invention is more specifically described in the following paragraphs by

reference to the drawings attached only by way of example. Other advantages and features will become apparent from the following description and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] In the accompanying drawings, which are incorporated in and constitute a part of this specification, embodiments of the invention are illustrated, which, together with a general description of the invention given above, and the detailed description given below, serve to exemplify the principles of this invention.

[0024] Fig. 1 is a block diagram of a computer system, in accordance with the principles of the present invention;

[0025] Fig. 2 is a flow chart of a method of reserve-recording a television program on the computer system, in accordance with the principles of the present invention;

[0026] Fig. 3 is a view showing a window display for setting up a reserve-recordation of the television program, in accordance with the principles of the present invention;

[0027] Fig. 4 is a view showing an identification window display for identifying the reserve-recording conditions in the computer system, in accordance with the principles of the present invention; and

[0028] Fig. 5 is a flow chart of a method of recording a television program.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] While the present invention will be described more fully hereinafter with reference to

the accompanying drawings, in which a preferred embodiment of the present invention is shown, it is to be understood at the outset of the description which follows that persons of skill in the appropriate arts may modify the invention here described while still achieving the favorable results of this invention. Accordingly, the description which follows is to be understood as being a broad, teaching disclosure directed to persons of skill in the appropriate arts, and not as limiting upon the present invention.

[0030] A method of recording a television program on a computer system will be described with respect to Fig. 5. The recording shown in Fig. 5 corresponds to a "reserve-recording". The phrase "reserve-recording" can refer to a recording of a signal which is set to be performed automatically at a predetermined time. For example, on 25 February 2001 a person can program a video cassette recorder (VCR) to record a television show which is scheduled to be broadcast on television on 27 February 2001. Thus, the phrase "reserve-recording" can correspond to a recording operation which is performed automatically, without user intervention, at a predetermined reserved time.

[0031] In Fig. 5, at step S510, power is supplied to a computer system. At step S520, a reserve-recording set-up program installed in the computer system is executed to allow a user to set up a broadcasting channel to be recorded and a broadcast time thereof. At step S530, where the computer system is on at the time of initiating the reserve-recording, the reserve-recording set-up program is automatically activated. At step S540, received television signals are

converted in a television receiver part into digital files. These digital files can correspond to video files such as Moving Picture Experts Group (MPEG) files, audio visual interleaved (AVI) files, RealPlayer media (RM) files, or Windows Media Player media (WMV) files, for example. At step S550, the digital files are stored in a hard disk drive which is a storage unit in the computer system. At step S560, after the recording is finished, the execution of the recording program automatically terminates.

[0032] However, in the television program reserve-recording method of Fig. 5, this method requires that the computer system be powered on prior to the reserve-recording, even while the user is not using the computer system. Also, in the method of Fig. 5, the computer system does not turn off after the recording is finished, thereby causing an unnecessary consumption of power.

[0033] Referring to Fig. 1, a computer system of the present invention is comprised of a central processing unit (CPU) 10 driving an operating system (OS) of the computer system, an input unit 20 inputting external commands into the CPU 10, a television receiver part 30 receiving external television signals therein, a monitor 40 outputting the television signals received in the television receiver part 30, and a hard disk drive 50 as a storage unit.

[0034] The CPU 10 is supplied with a power to drive the operating system of the computer system. The CPU 10 outputs the television signals to the monitor 40 in cooperation with the

television receiver part 30 and a recording part 53 to be described later, and stores them in the hard disk drive 50 substantially at the same time.

[0035] The hard disk drive 50 is comprised of a recording part 53 which is a software to receive the television signals, convert the received television signals into digital files such as MPEG files or AVI files, for example, and output and record the converted digital files, and a power control part 55 controlling a power supply to the CPU 10 according to reserve-recording conditions of the recording part 53 to turn the computer system on or off. The television signals converted into the digital files through the recording part 53 are stored in the hard disk drive 50.

[0036] The recording part 53 is comprised of a reserve-recording set-up part 60 which is a software to receive the television signals and set up the reserve-recording conditions, and a record-controlling part 70 outputting and recording the received television signals. The reserve-recording set-up part 60 includes a password skipping part 72.

[0037] The reserve-recording set-up part 60 is comprised of a reserve-recording set-up window display 61 for setting up the reserve-recording conditions, a mode selection window display 80 for selecting a power mode (that is, a power saving mode or a normal mode) of the central processing unit after setting up the recording conditions, and an identification window display 63 for identifying the set-up reserve-recording conditions. Where the computer system needs to have a password to operate it, the password skipping part 72 in the reserve-recording set-up part

60 installs a password skip flag at a password designating point of a system basic input output system (BIOS). Accordingly, when the power mode is switched from the power saving mode to the normal mode, the password can be automatically skipped although it is established in the system.

[0038] Thus, if a password is required when the computer system goes from power saving mode to normal mode, the password skipping part 72 can enable the present invention to work properly without user intervention, because the password requirement will not impede the process of the present invention. The password skipping part 72 can be set to cause the computer system to go from power saving mode to normal mode without requiring a user to manually enter a password at the moment that the computer system goes from power saving mode to normal mode for the recording of television signals in accordance with the principles of the present invention. Also, the password skipping part 72 can be not set, thus causing the computer system to require that a user manually enter a password at the moment that the computer system goes from power saving mode to normal mode for the recording of television signals. The present invention can also work without the password skipping part 72, because some computer systems are configured to not require a password when changing from a power save mode to a normal mode. The password skipping part 72 is a desirable enhancement which adds convenience.

[0039] The password skipping part 72 can be configured to eliminate the need for a password to be entered only at times when a television signal will be recorded. Thus, if the mouse of the

computer system is moved and the computer system is starting to change from the power save mode to a normal mode, then the password would be required to be entered by the user, since television signals are not about to be recorded.

[0040] The user can select a desired television broadcasting channel and its broadcast time as the reserve-recording conditions through the reserve-recording set-up window display 61. The mode selection window display 80 shown up along with the reserve-recording set-up window display 61 is used in selecting the power mode of the CPU 10 after the user sets up the reserve-recording conditions. The user can select the power saving mode while he or she is not using the computer after setting up the reserve-recording conditions, and he or she can select the normal mode while he or she continues to use the computer.

[0041] The identification window display 63 for identifying the reserve-recording conditions is used in changing, withdrawing or approving the set-up reserve-recording conditions displayed in the monitor 40 when the power mode of the system is changed from the power saving mode to the normal mode by the user after setting up the reserve-recording conditions.

[0042] The record-controlling part 70 receives the television signals through the television receiver part 30, converts them into digital files such as MPEG files or AVI files, for example, which can be used in the computer system and outputs them to the monitor 40, and at the same time stores them in the hard disk drive 50. The record-controlling part 70 allows the user to

determine whether to continue to use the computer system or whether to stop to operate it, through the mode selection window display 80, after the recording is finished.

[0043] The power control part 55 is a kind of application program for controlling hardware of the computer system. The power control part 55 controls the power supply to the CPU 10 according to the reserve-recording conditions so that the power mode is automatically changed either to the normal mode under which the power is supplied to the CPU 10, or to the power saving mode under which the power is not supplied to the CPU 10.

[0044] Under the normal mode, all the hardware of the computer system including the CPU 10 is operated in a normal manner. For example, the process of receiving the television signals in the television receiver part 30 and storing them in the hard disk drive 50 is performed in the normal mode. However, if the power mode is converted into the power saving mode by the power control part 55, all the jobs done up to that time are saved in the hard disk drive 50, and then the monitor 40, the hard disk drive 50, and the CPU 10 are turned off, and thus the computer system is finally turned off.

[0045] Referring to Fig. 2, the process of receiving the television signals and storing them in the hard disk drive 50 according to the reserve-recording conditions will be described. A user connects a power to the computer system to activate the reserve-recording set-up part 60, for receiving television signals and storing them in the hard disk drive 50 in the form of digital file

(S10). Subsequently, the reserve-recording set-up window display 61 is shown up as seen in Fig. 3, allowing the user to set up the reserve-recording conditions, and accordingly, the user sets up a television broadcasting program desired for reserve-recording and a broadcast time (S20).

[0046] Once the reserve-recording conditions are set up, the window display shows up the mode selection window display 80 through which the user is allowed to determine whether to stop using the computer system after setting up the reserve-recording conditions or whether to continue using the computer system (S30). It is determined whether the power saving mode is selected (S40). If the normal mode is selected, the computer system continues to be operated (S90), and then the power control part 55 supplies the power to the CPU 10 so as to allow the user to use the computer system.

[0047] If the power saving mode is selected, the process of terminating the computer system is conducted (S50). The power control part 55 stores all the jobs within a memory of the computer system, in the hard disk drive 50, and then turns the hard disk drive 50 and the CPU 10 off.

[0048] Under the off state of the computer system, if the user connects the power to resume use of the computer system (S60) or if the r eserved broadcast time approaches (S70), the computer system is automatically turned on (S80).

[0049] In the step S70, the power control part 55 checks the reserve time using a timer (not

shown) installed in the computer system, and supplies the power to the CPU 10 a few minutes before the reserve-recording time starts, to allow the computer system to be turned on for the reserve-recording. The power control part 55 determines whether the computer system is turned on by the user at the same time as the system is turned on (S100).

[0050] Where the computer system is not turned on by the user, a determination is made as to whether a password is required (S110). If no password was required, step S180 is performed after step S110. If a password is required, then step S130 is performed after step S110. If a password is required and was previously given to the system, the reserve-recording set-up part 60 gives a password skip flag to the system basic input output system (BIOS) to skip the password (S130).

[0051] After the record-controlling part 70 in the recorder part 53 is activated depending upon the reserve-recording conditions set up through the reserve-recording set-up part 60 (S180), it receives the television signals through the television recorder part 30, converts them into digital files employable in the computer system and outputs them to the monitor 40, and at the same time stores them in the hard disk drive 50 (S190).

[0052] The recording is finished by the record-controlling part 70 according to the reserve-recording conditions set up through the reserve-recording set-up part 60, and the mode selection window display 80 is shown up in the monitor 40, allowing the user to determine whether to

continuously use the computer or to maintain the computer in suspension (S200). Step S210 is performed after step S200, in rder to determine whether the mode is the power saving mode. Where the mode selection window display 80 is not used because of the user's sleep or rest, etc., the power saving mode is automatically selected and the step S50 is accordingly conducted. Conversely, where the power mode can be selected through the mode selection window display 80, it is determined whether the power saving mode is selected or not, and the step S90 or S50 is conducted depending upon the determination (S210).

[0053] Where it is determined through the step S100 that the system is turned on by the user, the step S150 is then conducted. In the step S150, the identification window display 63 for identifying the reserve-recording conditions within the reserve-recording set-up part 60 is displayed as in Fig. 4, allowing the user to change, withdraw or approve the reserve-recording conditions. Where the reserve-recording conditions are approved in the step S160 or they are changed in the step S170, the step S180 is then conducted. Where the reserve-recording conditions are withdrawn, the step S90 is conducted. Where the reserve-recording conditions are not identified for a predetermined period of time after the identification window display 63 is shown up, although this situation is not shown in the figures, the reserve-recording conditions are automatically approved and subsequently the step S180 is conducted, to activate the record-controlling part 50.

[0054] In the preferred embodiments described above, the television signals received through

the television receiver part 30 are converted into digital files such as MPEG files or AVI files, for example, and they are saved in the hard disk drive 50. However, the objects of the present invention may be achieved even if they are saved in a compact disk drive (not shown), or a recordable digital versatile disk (DVD) drive (not shown), or other form of storage.

[0055] As described above, the computer system and the method for storing television signals therein, according to the present invention, allows the computer system to be automatically turned on for reserve-recording a television program and to be automatically turned off after the reserve-recording is finished, thereby minimizing a power consumption due to the reserve-recording.

[0056] While the present invention has been illustrated by the description of embodiments thereof, and while the embodiments have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details, representative apparatus and method, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of the applicant's general inventive concept.